Claims:

1. An antimicrobial composition comprising an organic, polycationic, polymeric, antimicrobial material that can bind non-leachably to a surface such that the antimicrobial material does not release biocidal amounts of leachables into a contacting solution.

2. The composition of claim 1, wherein the antimicrobial material comprises a biguanide polymer.

3. The composition of claim 2, wherein the biguanide polymer is poly(hexamethylenebiguanide), poly(hexamethylenebiguanide) hydrochloride, poly(hexamethylenebiguanide) gluconate, poly(hexamethylenebiguanide) stearate, or a derivative thereof.

4. The composition of claim 1, wherein the antimicrobial material is substantially water-insoluble.

5. The composition of claim 2, wherein the biguanide polymer is present as an adduct with a substantially water-insoluble organic compound.

6. The composition of claim 5, wherein the substantially water-insoluble organic compound comprises a reactive member selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

7. The composition of claim 5, wherein the substantially water-insoluble organic compound is an epoxide selected from the group consisting of methylene-bis-N,N-diglycidylaniline, bisphenol-A-epichlorohydrin and N,N-diglycidyl-4-glycidyloxyaniline.

8. The composition of claim 2, wherein the antimicrobial composition further comprises a metal, and wherein the metal and the antimicrobial material form an antimicrobial complex.

9. The composition of claim 8, wherein the metal renders the antimicrobial material substantially water-insoluble.

10. The composition of claim 8, wherein the metal is silver or a silver compound.

11. The composition of claim 10, wherein the silver compound is silver nitrate.

12. The composition of claim 10, wherein the silver compound is silver iodide.

13. The composition of claim 1, wherein the antimicrobial material can form a covalent bond with the surface.

14. The composition of claim 1, wherein the surface comprises a polypeptide.

15. The composition of claim 14, wherein the polypeptide is collagen.

16. The composition of claim 1, wherein the surface is living tissue.

17. The composition of claim 1, wherein the surface is skin.

18. The composition of claim 13, wherein the surface comprises a polypeptide.

19. The composition of claim 13, wherein the surface comprises a chemical group capable of forming a covalent bond.

20. The composition of claim 19, wherein the covalent bond can be generated at room temperature.

21. The composition of claim 19, wherein the chemical group is selected from the group consisting of an amino group, a carboxylic acid group, a hydroxyl group, or a sulfhydryl group.

22. The composition of claim 19, wherein the chemical group is selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde,

ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

23. The composition of claim 13, wherein the antimicrobial material comprises a chemical group capable of forming a covalent bond.

24. The composition of claim 23, wherein the covalent bond can be generated at room temperature.

25. The composition of claim 23, wherein the chemical group is selected from the group consisting of an amino group, a carboxylic acid group, a hydroxyl group, or a sulfhydryl group.

26. The composition of claim 23, wherein the chemical group is selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

27. The composition of claim 2, wherein the biguanide polymer is present as an adduct with 1-[3-(dimethylamino)propyl]-3-ethylcarbodiimide hydrochloride.

28. The composition of claim 1, wherein the antimicrobial material, when non-leachably bound to a surface, provides an antimicrobial activity that is persistent, even upon repeated contact with an aqueous solution.

29. The composition of claim 1, further comprising a marker.

30. The composition of claim 29, wherein the marker is an optical reporter.

31. The composition of claim 29, wherein the marker comprises a compound detectable under ultraviolet, visible, or infrared irradiation.

32. The composition of claim 31, wherein the marker comprises a compound that fluoresces under ultraviolet or infrared light.

33. The composition of claim 32, wherein the marker is selected from the group consisting of Fluorescent Brightener-28 and Tinopal SFP.

34. The composition of claim 1, further comprising about 30% to about 98% by weight of at least one alcohol selected from the group consisting of ethyl alcohol, n-propanol, and isopropanol.

35. The composition of claim 1, further comprising an antiseptic selected from the group consisting of ethanol, isopropyl alcohol, chlorhexidine gluconate, iodine, iodine-polyvinylpyrrolidone complex, triclosan, triclorocarban, benzalkonium chloride and para-chloro-meta-xylenol.

36. The composition of claim 1, further comprising a thickener, emollient, humectant, skin moisturizing agent or surfactant.

37. A dermal antiseptic composition comprising an organic, polycationic, antimicrobial polymer that binds to skin upon application.

38. The composition of claim 37, wherein the polymer associates with skin through hydrophobic interactions, electrostatic interactions, covalent bonds, or a combination thereof.

39. The composition of claim 37, wherein the antimicrobial polymer comprises poly(hexamethylenebiguanide), poly(hexamethylenebiguanide) hydrochloride, poly(hexamethylenebiguanide) gluconate, poly(hexamethylenebiguanide) stearate, or a derivative thereof.

40. The composition of claim 37, wherein the biguanide polymer is present as an adduct with a substantially water-insoluble organic compound.

41. The composition of claim 40, wherein the substantially water-insoluble organic compound comprises a reactive member selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

42. The composition of claim 40, wherein the substantially water-insoluble organic compound is an epoxide selected from the group consisting of methylene-bis-N,N-diglycidylaniline, bisphenol-A-epichlorohydrin and N,N-diglycidyl-4-glycidyloxyaniline.

43. The composition of claim 37, wherein the polymer can form a covalent bond with collagen at room temperature.

44. The composition of claim 37, wherein the polymer comprises a chemical group selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, amino, hydroxyl, sulfhydryl, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate, and alkyl halide.

45. The composition of claim 37, wherein the polymer forms a self-preserving, antimicrobial barrier upon application to skin, thus imparting a persistent antimicrobial activity.

46. The composition of claim 37, wherein the dermal antiseptic composition comprises a surgical scrub, a pre-operative skin preparation, a healthcare personnel handwash or an antiseptic handwash.

47. The composition of claim 37, wherein the dermal antiseptic composition comprises an antimicrobial soap, antimicrobial cream, antimicrobial hand sanitizer, antimicrobial deodorant or antimicrobial gel.

48. The composition of claim 37, wherein the composition is moisture and sweat resistant.

49. The composition of claim 37, wherein the composition provides deodorizing action over extended periods of time.

50. The composition of claim 37, further comprising an antimicrobial metal.

51. The composition of claim 50, wherein the metal is silver or a silver compound.

52. The composition of claim 51, wherein the silver compound is silver nitrate.

53. The composition of claim 52, wherein the silver compound is silver iodide.

54. The composition of claim 37, wherein the composition comprises an antiseptic selected from the group consisting of ethanol, isopropyl alcohol, chlorhexidine gluconate, iodine, iodine-polyvinylpyrrolidone complex, triclosan, triclorocarban, benzalkonium chloride and para-chloro-meta-xylenol.

55. The composition of claim 37, wherein the composition comprises a thickener, emollient, humectant, skin moisturizing agent or surfactant.

56. The composition of claim 37, further comprising an optical marker detectable under ultraviolet, visible, or infrared irradiation.

57. The composition of claim 56, wherein the marker fluoresces under ultraviolet or infrared light.

58. A method for enhancing the duration of efficacy of a dermal antiseptic formulation, the method comprising the step of:

mixing a polycationic antimicrobial material and a dermal antiseptic formulation, such that the antimicrobial material is capable of forming a self-preserving, antimicrobial barrier upon application of the formulation to skin, thereby enhancing the antimicrobial efficacy of the antiseptic formulation by imparting residual antimicrobial activity.

59. The method of claim 58, wherein the polycationic antimicrobial material comprises a biguanide polymer.

60. The method of claim 59, wherein the biguanide polymer comprises poly(hexamethylenebiguanide), poly(hexamethylenebiguanide) hydrochloride, poly(hexamethylenebiguanide) gluconate, poly(hexamethylenebiguanide) stearate, or a derivative thereof.

61. The method of claim 58, wherein the antimicrobial polycationic material comprises a biguanide polymer and a metal such that the metal is bound to the polycationic material.

62. The method of claim 61, wherein the metal is silver or a silver compound.

63. The method of claim 62, wherein the metal is silver nitrate.

64. The method of claim 63, wherein the metal is silver iodide.

65. The method of claim 59, wherein the biguanide polymer is present as an adduct with a substantially water-insoluble organic compound.

66. The method of claim 65, wherein the substantially water-insoluble organic compound comprises a reactive member selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

67. The method of claim 65, wherein the substantially water-insoluble organic compound is an epoxide selected from the group consisting of methylene-bis-N,N-diglycidylaniline, bisphenol-A-epichlorohydrin and N,N-diglycidyl-4-glycidyloxyaniline.

68. The method of claim 58, wherein the antimicrobial material comprises a chemical group capable of forming a covalent bond.

69. The method of claim 68, wherein the covalent bond can be generated at room temperature.

70. The method of claim 68, wherein the chemical group is selected from the group consisting of an amino group, a carboxylic acid group, a hydroxyl group, or a sulfhydryl group.

71. The method of claim 68, wherein the chemical group is selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

72. A method for imparting moisture and sweat resistance to extend the duration of efficacy of a skin deodorant formulation, the method comprising the steps of:

(i) providing a dermal deodorant formulation; and

(ii) mixing a polycationic antimicrobial material in the deodorant formulation, wherein the antimicrobial material can form a moisture and sweat resistant antimicrobial barrier upon application of the formulation to skin, thereby providing deodorizing efficacy over extended periods.

73. The method of claim 72, wherein the polycationic material imparts an antibacterial property to the skin deodorant formulation.

74. The method of claim 72, wherein the polycationic antimicrobial material comprises a biguanide polymer.

75. The method of claim 72, wherein the biguanide polymer comprises poly(hexamethylenebiguanide), poly(hexamethylenebiguanide) hydrochloride, poly(hexamethylenebiguanide) gluconate, poly(hexamethylenebiguanide) stearate, or a derivative thereof.

76. The method of claim 72, wherein the antimicrobial polycationic material comprises a biguanide polymer and a metallic material such that the metallic material is complexed or bound to the polycationic material.

77. The method of claim 76, wherein the metallic material is silver or a silver compound.

78. The method of claim 77, wherein the metallic material is silver nitrate.

79. The method of claim 77, wherein the metallic material is silver iodide.

80. The method of claim 74, wherein the biguanide polymer is present as an adduct with a substantially water-insoluble organic compound.

81. The method of claim 75, wherein the substantially water-insoluble organic compound comprises a reactive member selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

82. The method of claim 75, wherein the substantially water-insoluble organic compound is an epoxide selected from the group consisting of methylene-bis-N,N-diglycidylaniline, bisphenol-A-epichlorohydrin and N,N-diglycidyl-4-glycidyloxyaniline.

83. The method of claim 72, wherein the antimicrobial material comprises a chemical group capable of forming a covalent bond.

84. The method of claim 83, wherein the covalent bond can be generated at room temperature.

85. The method of claim 83, wherein the chemical group is selected from the group consisting of an amino group, a carboxylic acid group, a hydroxyl group, or a sulfhydryl group.

86. The method of claim 83, wherein the chemical group is selected from the group consisting of carbodiimide, isocyanate, isothiocyanate, succimidyl ester, epoxide, carboxylic acid, acid chloride, acid halide, acid anhydride, succimidyl ether, aldehyde, ketone, sulfonyl chloride, sulfonyl halide, alkyl methane sulfonate, alkyl trifluoromethane sulfonate, alkyl paratoluene methane sulfonate and alkyl halide.

87. A method for detecting the presence of antimicrobial compositions on a surface, the method comprising the steps of:

(i) providing on the surface the antimicrobial composition of claim 29; and

(ii) exposing the surface to a detector capable of detecting the presence of the marker of claim 29 on the surface.

88. A method for monitoring a subject's compliance with aseptic procedures, the method comprising the steps of:

(i) providing to the subject the antimicrobial composition of claim 29; and

(ii) subsequently exposing the subject to a detector capable of detecting the presence of the marker of claim 29 on the subject.

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